UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/269,972 | 04/08/1999 | YUKIO NAKAJIMA | Q53854 | 1844 |

7590    04/07/2004

SUGHRUE MION ZINN MACPEAK & SEAS
2100 PENNSYLVANIA AVENUE NW
WASHINGTON, DC  200373202

| EXAMINER |
|---|
| GARCIA OTERO, EDUARDO |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2123 | 22 |

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

# BEFORE THE BOARD OF PATENT APPEALS
## AND INTERFERENCES

Paper No. 22

Application Number: 09/269,972
Filing Date: April 08, 1999
Appellant(s): NAKAJIMA, YUKIO

Ronald L. Kimble, Registration No. 35,603
For Appellant

## EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/12/04.

MAILED

APR 0 7 2004

Technology Center 2100

*(1)    Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

*(2)    Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or

be directly affected by or have a bearing on the decision in the pending appeal is contained in the

brief.

*(3)    Status of Claims*

The statement of the status of the claims contained in the brief is correct.

*(4)    Status of Amendments After Final*

No amendment after final has been filed.

*(5)    Summary of Invention*

The summary of invention contained in the brief is correct.

*(6)    Issues*

The appellant's statement of the issues in the brief is correct.

*(7)    Grouping of Claims*

Appellant's brief includes a statement that claims 1-19 do not stand or fall together and

provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

*(8)    Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

*(10)   Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims.

## *Claim Rejections - 35 USC § 102(e)*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-6 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa et al. US Patent 5,710,718.

**Claim 1** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 1 is an independent "method" claim with 3 limitations.

First, **"conversion system in which a non-linear correspondence between the design parameters of a tire... and the performances of a tire"** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE", and FIG 31A, and column 10 lines 25-29 "FIG. 31A is a diagram illustrating a continuous chevron-shaped mapping functions". The Kamegawa'718 verbal description of FIG 31A (continuous chevron-shaped) is a bit awkward and not very clear, possibly due to translation issues. It would be more accurate to describe Kamegawa **FIG 31A as bell-shaped (and non-linear),** using common terms of art. Note FIG 32A also is non-linear.

**Additionally, please note that Kamegawa's bell-shaped and non-linear FIG 31A appears to be identical to FIG 12A of the present application, which is also bell-shaped and non-linear.** Thus, Kamegawa discloses the precise type (bell-shaped) non-linear function with is shown in FIG 12A of the present application.

Second, **"objective function…setting a constraint"** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE".

Third, **"optimum value of the objective function"** is disclosed by Kamegawa '718 FIG 2 element 116 "HAS THE VALUE OF THE OBJECTIVE FUNCTION CONVERGED?".

**Claim 2** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 2 depends from Claim 1 ("according to claim 1").
Claim 2 further states "wherein said step (c) comprises".

The Examiner hereby interprets Applicant's "wherein said step (c) comprises" to mean "wherein said step (c) **further** comprises".

However, the Examiner fails to find any additional limitations (or any substantial difference) in the step (c) of dependent Claim 2 in comparison with the step (c) of independent Claim 1. Specifically, the limitations of Claim 2 are a substantial duplicate of limitations from parent Claim 1.

Thus, Claim 2 is rejected for the same reasons as Claim 1.

Additionally, Applicant is advised that should Claim1 be found allowable, then Claim 2 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

**Claim 3** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 3 depends from Claim 2 ("according to claim 2").

Claim 3 further states "wherein said step (c) comprises". The Examiner hereby interprets Applicant's "wherein said step (c) comprises" to mean "wherein said step (c) **further** comprises".

Thus, Claim 3 depends from Claim 2 and contains two additional limitations, and is rejected for the same reasons plus these additional reasons:

First, **"sensitivity of the objective function"** is disclosed by Kamegawa '718 FIG 2 element 112 "CALCULATE SENSITIVITY FOR EACH DESIGN VARIABLE".

Second, **"calculating a value of the objective function when the design variable is changed to correspond to a predicted amount and a value of the constraint condition when the design variable is changed"** is disclosed by Kamegawa '718 FIG 2 element 110 "CALCULATE THE VALUE OF THE OBJECTIVE FUNCTION IN THE DETERMINED TIRE SHAPE AND CALCULATE THE VALUE OF THE CONSTRAINT".

<u>Claim 4</u> is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 4 depends from Claim 1 ("according to claim 1").

Claim 4 further states "wherein said step (c) comprises the steps of (d) selecting..." The Examiner hereby interprets Applicant's "wherein said step (c) comprises the steps of (d) selecting..." to mean "wherein said claim 1 **further** comprises: (d) selecting..."

Thus, Claim 4 depends from Claim 1 and contains three additional limitations, and is rejected for the same reasons plus these additional reasons:

First, **"(d) selecting, as a design variable, one of the design parameters included in the conversion system"** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE".

Second, **"(e) changing a value of the design variable...until the optimum value of the objective function is given"** is disclosed by Kamegawa '718 FIG 2 element 116 "HAS THE VALUE OF THE OBJECTIVE FUNCTION CONVERGED?".

Third, **"(f) designing a tire...design variable which gives the optimum value of the objective function"** is disclosed by Kamegawa '718 FIG 2 element 116 "HAS THE VALUE OF THE OBJECTIVE FUNCTION CONVERGED?".

<u>Claim 5</u> is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 5 depends from Claim 4 ("according to claim 4").

Claim 5 further states "wherein said step (b) comprises...". The Examiner hereby interprets Applicant's "wherein said step (b) comprises..." to mean "wherein said step (b) **further** comprises".

Thus, Claim 5 depends from Claim 4 and contains one additional limitation, and is rejected for the same reasons plus these additional reasons:

**"a constraint condition"** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE".

**Claim 6** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 6 depends from Claim 4 ("according to claim 4").

Claim 6 further states "wherein said step (e) comprises...". The Examiner hereby interprets Applicant's "wherein said step (e) comprises..." to mean "wherein said step (e) **further** comprises".

Thus, Claim 6 depends from Claim 4 and contains three additional limitation, and is rejected for the same reasons plus these additional reasons:

First, **"sensitivity of the objective function"** is disclosed by Kamegawa '718 FIG 2 element 112 "CALCULATE SENSITIVITY FOR EACH DESIGN VARIABLE".

Second, **"value of the objective function when the design variable is changed"** is disclosed by Kamegawa '718 FIG 2 element 110 "CALCULATE THE VALUE OF THE OBJECTIVE FUNCTION IN THE DETERMINED TIRE SHAPE, AND CALCULATE THE VALUE OF THE CONSTRAINT".

Third, **"optimum value of the objective function"** is disclosed by Kamegawa '718 FIG 2 element 116 "HAS THE VALUE OF THE OBJECTIVE FUNCTION CONVERGED".

**Claim 7** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 7 depends from Claim 1 ("according to claim 1"). Claim 7 further states "wherein said step (c) comprises the steps..." The Examiner hereby interprets Applicant's "wherein said step (c) comprises the steps..." to mean "wherein said claim 1 **further** comprises the steps..."

Thus, Claim 7 depends from Claim 1 and contains nine additional claims, and is rejected for the same reasons plus these additional reasons:

First, **"plurality of base models"** is disclosed by Kamegawa '718 FIG 29A element 204 "CALCULATE INITIAL VALUES OF OBJECTIVE FUNCTION AND CONSTRAINT OF N MODELS".

Second, **"adaptive function"** is disclosed by Kamegawa '718 FIG 29A element 216 "TO BE MUTATED?", and FIG 29A element 206 states "CALULATE **ADAPTIVE FUNCTION** FROM OBJECTIVE FUNCTION AND CONSTRAINT OF MODELS", emphasis added.

Third, **"intersecting the design variables"** is disclosed by Kamegawa '718 FIG 29A element 210 "TO BE INTERSECTED?"

Fourth, **"obtaining an objective function...by changing the design variable"** is disclosed by Kamegawa '718 FIG 29B element 204 "CALCULATE OBJECTIVE FUNCTION AND CONSTRAINT OF TWO MODELS DETERMINED".

Fifth, **"storing the base models"** is disclosed by Kamegawa '718 FIG 29A element 202 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLES OF N TIME MODELS".

Sixth, **"repeating the storing step until the number of stored base models reaches a predetermined number"** is disclosed by Kamegawa '718 FIG 29A element 202 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLES) OF N TIRE MODELS".

Seventh, **"predetermined convergence condition"** is disclosed by Kamegawa FIG 29B element 230 "CONVERGE?".

Eighth, **"repeated until"** is disclosed by Kamegawa FIG 29B element 230 "CONVERGE?".

Ninth, **"if the predetermined convergence conditions satisfied, designing a tire...optimum value of the objective function"** is disclosed by Kamegawa '718 FIG 29B element 232 "DETERMINE TIRE CONFIGURATION".

**Claim 9** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 9 is a claim for a product "A tire which is formed according to design parameters designed by a tire design method according to Claim 1."

Claim 9 is a product claim with the same limitations as method Claim 1, and thus is rejected for the same reasons as Claim 1 above.

**Claim 10** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claim 10 is an independent "apparatus" claim with 3 limitations.

First, **"conversion system calculating means for obtaining a non-linear corresponding relation between design parameters of a tire and performances of a tire"** disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE", and FIG 31A, and column 10 lines 25-29 "FIG. 31A is a diagram illustrating a continuous chevron-shaped mapping functions". The Kamegawa'718 verbal description of FIG 31A (continuous chevron-shaped) is a bit awkward

and not very clear, possibly due to translation issues.  It would be more accurate to describe **FIG 31A as bell-shaped (and non-linear)**, using common terms of art.  Note FIG 32A also is non-linear.

Second, **"input means for inputting an objective function and a constraint condition as optimization..."** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE".

Third, **"optimization calculation means..."** is disclosed by Kamegawa '718 FIG 2 element 116 "HAS THE VALUE OF THE OBJECTIVE FUNCTION CONVERGED?".

**Claims 11-13** are rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718.  Claims 11-13 are apparatus claims ("An optimization analyzing apparatus") with the same limitations as method Claims 2-7, and therefore are rejected for the same reasons as Claims 2-7 above.

**Claim 15** is rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718.  Claim 15 is an independent "storage medium having a stored optimization analyzing program" claim with 3 limitations.

First, **"determine a non-linear corresponding relation between design parameters of a tire and performances of a tire"** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE", and FIG 31A, and column 10 lines 25-29 "FIG. 31A is a diagram illustrating a continuous chevron-shaped mapping functions".  The Kamegawa'718 verbal description of FIG 31A (continuous chevron-shaped) is a bit awkward and not very clear, possibly due to translation issues.  It would be more accurate to describe **FIG 31A as bell-shaped (and non-linear)**, using common terms of art.  Note FIG 32A also is non-linear.

Second, **"determine an objective function which expresses the performance of the tire and determine a constraint condition..."** is disclosed by Kamegawa '718 FIG 2 element 102 "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE".

Third, **"determine a design parameter of the tire, which gives an optimum value of the objective function..."** is disclosed by Kamegawa '718 FIG 2 element 116 "HAS THE VALUE OF THE OBJECTIVE FUNCTION CONVERGED?".

**Claims 16-19** are rejected under 35 U.S.C. 102(e) as being anticipated by Kamegawa '718. Claims 16-19 are "storage medium" claims with the same limitations as method Claims 2-7, and therefore are rejected for the same reasons as Claims 2-7 above.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

> Determining the scope and contents of the prior art.
>
> Ascertaining the differences between the prior art and the claims at issue.
>
> Resolving the level of ordinary skill in the pertinent art.
>
> Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamegawa et al US Patent 5,710,718 in view of Tang US Patent 6,061,673.

**Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamegawa et al US Patent 5,710,718 in view of Tang US Patent 6,061,673.

Claim 8 depends from Claim 1 with one additional limitation, and is rejected for the same reasons plus these additional reasons:

All of the limitations from Claim 1 are disclosed by Kamegawa '718 as discussed above in the 35 U.SC 102(e) rejection above.

Kamegawa '718 does not expressly disclose "multi-layered feed forward type neural network".

**"multi-layered feed forward type neural network"** is disclosed by Tang '673 at FIG 5, and at Column 10 line 8 "system shown in FIG. 5 is a multi-layered feed forward network".

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use Tang '673 to modify Kamegawa '718. One of ordinary skill in the art would have been motivated to do this to "obtain specified learning effects during a very short learning period" according to Tang '673 at Column 13 line 59.

**Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamegawa et al US Patent 5,710,718 in view of Tang US Patent 6,061,673.

Claim 14 depends from Claim 10 with one additional limitation, and is rejected for the same reasons plus these additional reasons:

All of the limitations from Claim 10 are disclosed by Kamegawa '718 as discussed above in the 35 U.SC 102(e) rejection above.

Kamegawa '718 does not expressly disclose "multi-layered feed forward type neural network".

**"multi-layered feed forward type neural network"** is disclosed by Tang '673 at FIG 5, and at Column 10 line 8 "system shown in FIG. 5 is a multi-layered feed forward network".

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use Tang '673 to modify Kamegawa '718. One of ordinary skill in the art would have been motivated to do this to "obtain specified learning effects during a very short learning period" according to Tang '673 at Column 13 line 59.

*(11)   Response to Argument*

Applicant's arguments raise three issues:

- **non-linearity of objective function** at Appeal Brief pages 5-9,
- **adaptive function** at Appeal Brief page 9, and
- **motivation** at Appeal Brief pages 10-11.

OBJECTIVE FUNCTIONS. A brief and broad discussion of objective function optimization may be useful before addressing Applicant's specific arguments.

It is very difficult to define, and also very difficult to find the "best" design for complex systems such as tires, or engines, or cars, or integrated circuits. There are an almost infinite number of possible designs, created by various combinations of the many individual features. Unfortunately, improvement of one design feature generally can only be accomplished at the

expense of another design feature. For example, the fuel efficiency of an engine versus the power of an engine. The overall performance of the complex system may be defined as a single number generated by an objective function. For example, the design of the Ford Taurus used an objective function based upon over 400 design features.

The "best" design is thus found by the maximizing the value of said objective function. There are many difficulties in finding the maximum value. One of the difficulties is that the objective function is typically non-linear. Said non-linearity makes it difficult or impossible to predict system performance. Thus, searching for the best design is a complex and difficult task. Other potential difficulties include: multiple local maxima which may yield local maximization rather than global maximization, constraints, and discontinuities, but these other difficulties are beyond the scope of the present discussion.

NON-LINEARITY: DEFINITIONS. Independent claim 1 states "(a)... a non-linear correspondence between design parameters of a tire... and performances of the tire". In other words (introducing a term of art), claim 1 requires a non-linear objective function. The other independent claims 5 and 10 also state "non-linear".

The McGraw-Hill Dictionary of Scientific and Technical Terms, Fourth Edition, by McGraw-Hill Companies, Inc., ISBN 0-07-05270-9, 1989 defines:

- **"linear"** as "Having an output that varies in direct proportion to the input." and
- **"nonlinear"** as "Pertaining to a response that is other than directly or inversely proportional to a given variable."

Applicant asserts that the prior art Kamegawa'718 does not disclose said "nonlinear correspondence".

The Examiner concedes that Kamegawa'718 does not explicitly use the term "nonlinear". However, the Examiner maintains that one of ordinary skill in the art would interpret Kamegawa'718 as disclosing "nonlinear" for the reasons below, especially FIG 31A.

(Note that linearity and nonlinearity have slightly more complex definitions when dealing with system analysis, but these more complex definitions do not appear appropriate here.)

NONLINEARITY: FIGURES. First, Kamegawa'718 FIG 31A is clearly nonlinear. Regarding FIG 31A, Kamegawa column 10 lines 25-29 state:

- "FIGS. 31A and 31B are diagrams illustrating chevron-shaped mapping functions, wherein FIG. 31A is a diagram illustrating a continuous chevron-shaped mapping function, and FIG. 31B is a diagram illustrating a linear chevron-shaped mapping function;"

Kamegawa'718 verbal description of FIG 31A and 31B are not very clear, possibly due to translation issues. **It would be more accurate to describe FIG 31A as a bell-shaped (and non-linear) function.** (As an aside, technically, FIG 31B is not linear over entire domain, and would be more clearly described as a piece-wise linear function because it is described by one linear function over the first half, and by a different linear function over the second half.) Similarly, note First, Kamegawa'718 FIG 32A is also non-linear.

**Thus, Kamegawa'718 FIG 31A and FIG 32A are clearly non-linear.**

Additionally, please note that Kamegawa's bell-shaped and non-linear FIG 31A appears to be identical to FIG 12A of the present application, which is also bell-shaped and non-linear. Thus, Kamegawa discloses the precise type (bell-shaped) non-linear function with is shown in FIG 12A of the present application.

NONLINEARITY: SEARCH PROCEDURES. In addition to the above figures, the Kamegawa'718 search optimization procedure contains certain steps which are apparently directed towards non-linear functions. The following paragraphs are copied from the Advisory action mailed 11/3/03.

- The Examiner notes that Kamegawa is using a technique for maximizing (or minimizing) the objective function that is useful when the objective function is non-linear. Using "sensitivities" (in place of the constant derivative of a linear function) to predict the maximum of the objective function implies (though does not require) that the objective function is non-linear. **Similarly, repeating these predictions until the objective function converges implies (though does not require) that the objective function is non-linear. Note that if the objective function was linear, then the "sensitivity" for each design variable would not have to be repeatedly calculated.** Thus, Kamegawa's procedure is explicitly designed to handle non-linear objective functions, though Kamegawa does not explicitly state the term "non-linear".

- If Kamegawa's objective functions were limited to linear functions, then simpler predictive algorithms could be used. Thus, Kamegawa implicitly discloses non-linear functions.

- The term "local derivative" was introduced by the Examiner, and not by Kamegawa. If the system was linear, then the derivative (or "sensitivity") would be constant, and the derivative could be calculated once (locally, similar to Kamegawa's sensitivity), and the derivative would remain constant (globally).

- **In summary, the whole point of Kamegawa's objective optimization search algorithm is to allow for non-linearity.**

NONLINEARITY: CONTEXT. Kamegawa '718 FIG 2 element 102 states "DETERMINE OBJECTIVE FUNCTION, CONSTRAINT, AND DESIGN VARIABLE", and should be interpreted in the context of the entire publication, particularly in view of said figures and search procedures as discussed above. **Thus, Kamegawa'718 FIG 2 "OBJECTIVE FUNCTION" discloses both non-linear and linear objective functions,** in the context of the entire publication, especially FIG 31A which discloses a non-linear bell-shaped function.

ADAPTIVE FUNCTION: CONTEXT. Applicant asserts that the limitation "adaptive function" in claims 7, 13 and 19 is not disclosed by Kamegawa '718 FIG 29A element 216 "TO BE MUTATED?".

Similar to the above discussion, please note that Kamegawa'718 FIG 29A "MUTATED" should be interpreted in the context of the entire FIG 29A. Specifically, FIG 29A element 206 states "CALULATE **ADAPTIVE FUNCTION** FROM OBJECTIVE FUNCTION AND CONSTRAINT OF MODELS". Thus, Kamegawa'718 FIG 29A does disclose the "adaptive function" limitation of claims 7, 13, and 19.

MOTIVATION FOR CLAIMS 8 AND 14: MUTATION AND NEURAL NETWORKS. Claim 8 states "said conversion system is constructed with data in a multi-layered feed forward type neural network which as learned so as to convert the design parameters of the tire to performances thereof". Applicant asserts that there is not adequate motivation for combining the multi-layered feed forward neural network from Tang'673 with Kamegawa'718. Specifically, Applicant Appeal Brief page 11 characterizes Kamegawa'718 as "imposes a selection process on a plurality of basic models for subsequently determining, through iterative

calculations, an objective function to achieve a predetermined performance (see column 6, line 13-4)".

Applicant's characterization of Kamegawa'718 is rather narrow, and apparently refers to the relatively simple search technique of prediction based upon local sensitivities (or local derivatives) as disclosed by Kamegawa'718 FIG 2. Note that Kamegawa'718 also discloses other (more complex) search techniques.

Specifically, Kamegawa'718 FIG 29A also discloses the alternative complex search technique of mutation at FIG 29A element 216 "MUTATED" and element 220 "MUTATED". Complex artificial intelligence search type search techniques such as mutation are efficient when the underlying objective function is nonlinear and highly complex. Mutation search techniques are also known as genetic algorithms.

Genetic algorithms "learn" from their searches (the results of the mutations), and iteratively apply the results to attempt to yield better solutions (maximize the objective function). Note the iterative looping in Kamegawa'718 FIG 29A and 29B.

Similarly, Tang'673 neural networks are another type artificial intelligence system. Similar to the genetic algorithms, neural networks iteratively process information, and iteratively modify themselves as a function of the previous results.

In summary, one of ordinary skill in the art would be familiar with the complex search techniques of both mutation and neural networks, and would be motivated to use said complex search techniques to find better solutions more quickly, in comparison to the relatively simple search technique of prediction based upon local sensitivities (or local derivatives) as disclosed by Kamegawa'718 FIG 2.

**In other words, one of ordinary skill in the art would be motivated to use Tang'673 to modify Kamegawa'718 FIG 29A and 29B to "obtain specified learning effects during a very short learning period" according to Tang '673 at Column 13 line 59.**

In conclusion, the Examiner has addressed the three issues raised by the Applicant:

- **non-linearity** is disclosed by Kamegaw FIG 31A bell-shaped non-linear function,
- **adaptive function** is disclosed by Kamegawa FIG 29A element 206 adaptive function, and

- **motivation** to combine is to obtain a very short learning curve according to Tang.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

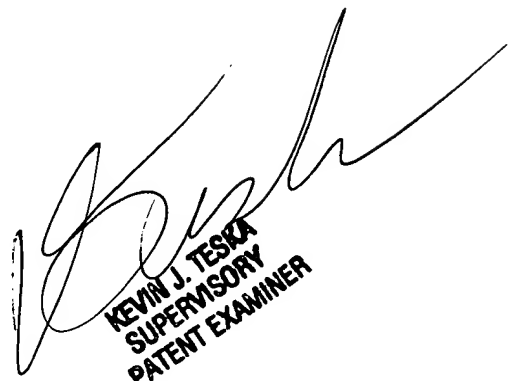Eduardo Garcia-Otero, Assistant Examiner

April 1, 2004

Conferees

    Kevin Teska, Supervisory Patent Examiner

    Russell Frejd, Primary Examiner

    Dr. Hugh Jones, Primary Examiner

SUGHRUE MION ZINN MACPEAK & SEAS
2100 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20037-3202